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EDITED BY J. HAY TAYLOR.

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Notes.

TOWARDS the latter part of November, we intend (through the kindness of Mr. Wilkie) to show a selection of the Old Polytechnic Slides at the Lantern Society, 20, Hanover Square, using two of the old lanterns and fittings for the purpose.—Particulars will be announced in our next issue.

* * *

IN the Antwerp Exhibition we do not remember to have seen a single magic lantern, and in the shop windows of opticians in the larger cities in Belgium they are, practically speaking, never seen. These remarks do not apply to the toy lanterns for children sold in bazaars and such places at from a few pence to a few shillings each. The inference is, that in all probability lanterns are not so much in demand for home use in Belgium as they are here, despite the average higher education there of the great bulk of the people. Belgium, although small, is a wealthy nation, and it is known among successful patentees to be a good country in which to take out patents for valuable inventions.

* * *

IT might be well if those connected with the manufacture of lanterns in this country were to make serious enquiry as to the state of the lantern trade in Belgium, and if it should be found to be exceedingly small, try to effect a business opening there by sending over some of the better classes of instruments, and taking steps to popularise the use of the lanterns there in home circles. It may be assumed that the excellent educational establishments in Belgium are already well equipped in this respect.

* * *

On 22nd ult., a large number of guests were present at the opening soirée of the exhibition of the Royal Photographic Society, 5A, Pall Mall. This exhibition will remain open daily until the 14th inst. The pictures exhibited are of an exceptionally high order, having been carefully selected. On Monday, Wednesday, and Saturday evenings a selection of lantern transparencies will be projected on the screen.

* * *

From 1st inst. to November 4th "The Photographic Salon" will hold an exhibition of photographs at the Dudley Gallery, Piccadilly, W. The pictures are selected solely and strictly for their pictorial qualities.

* * *

Many of the pictures sent, but not accepted, at the two foregoing exhibitions will be on exhibition for six weeks, from 13th inst., at the rooms of the Central Photographic Club, 13, Henrietta Street, W.C.

* * *

Perhaps never was the growing popularity of the magic lantern for the public demonstration of scientific subjects more strongly exemplified than at the recent meeting of the British Association at Oxford. A week or two before the meeting began, some authors of papers stipulated that arrangements for lantern projections should be provided, before they sent in their papers at all. Then again, in the popular sections, frequented most by those temporary members who are not scientific, such as the geographical section, in the printed programme of the proceedings of each day, it was announced what papers would be illustrated with lantern projections. For instance, on Monday, August 13th last, the first four papers on the list, straight off, to be read before the geographical section, were announced in the journal of sectional proceedings as follows:—"(1) Miss Baildon, 'A Visit to New Guinea,' lantern illustrations; (2) E. G. Ravenstein, 'The Climatology of Topical Africa,' lantern illustrations; (3) Dr. Joseph Moloney, 'The Lakes route to Uganda,' lantern illustrations; (4) H. Weld Blundell, 'A Journey in the Libyan Desert,' lantern illustrations." The demand for darkened rooms in the daytime was easily met in the various theatres connected with the laboratories of Oxford University, but what the circumstances in this respect will be next year in Ipswich, which is neither a large town nor a town of the university type, is a question. The subject had better receive attention there well in advance of the meeting. Sir Douglas Galton will be president of the meeting of the British Association at Ipswich.

* * *

A ten candle standard light, produced by not very costly means, would be specially useful in printing lantern slides by superposition, because the time of exposure once ascertained for any particular negative, the printing of successive copies of that negative can go on with mechanical regularity, so long as a batch of plates of uniform rapidity is employed. If the light be turned out, and lit again next day, there will be no doubt as to the absence of luminous variation due to the break in the work. Mr. Vernon Harcourt exhibited a new ten candle standard light at Section A of the British Association at Oxford. Except for some small accessories, it differed little from an ordinary paraffin lamp in external appearance. Pentane was burnt in it, because of its constant composition; an annular wick was used, but did not come into contact with the flame, for, by means of thick brass work, the pentane was vapourised a little below the top of the burner. The top of the flame was cut off from view by a little metal screen, so that variations in the length of the flame should not cause variations in the amount of utilised light; he said that he found the light emitted by the lower part of the flame to be practically constant.

* * *

The British copyright of Dr. Wilson's (New York) "Cyclopœdia of Photography" has been secured by Dawbam & Ward (Ltd.), 6, Farringdon Avenue, E.C., and will be on the market in about six weeks.

* * *

The Lantern Barnum (Mr. Walter Tyler), in addition to his premises at 48 and 50, Waterloo Road, has bought the lease of number 94. These new premises are being fitted up in connection with the cylinder and compressed gas department.

Were Saturators known to the Ancient Egyptians?

We have received a communication from a reader who has had experience in limelight matters probably before a large percentage of our present readers were born. In speaking of saturators he says:—

"Are saturators and carburetters a new or an old invention? It is a true saying that there is 'nothing new under the sun,' and this applies very forcibly to lantern apparatus, which will be apparent to anyone who has read the correspondence in the Optical Magic Lantern Journal upon 'Dissolving Views.' In a letter by 'Photograph' in September issue there is a very true remark, 'One need to be an old hand, &c., &c., to know what not to patent.'

The greatly increasing number of articles which have appeared of late respecting saturators has been a source of much amusement to me, who can carry my recollections far back to the early part of the present century. Much of what has been written is utter twaddle, some of the information is no doubt new and useful; but nearly the whole of it would lead one to suppose these instruments were quite modern, whereas I used similar apparatus many years before most of your readers had left their nurses' apronstrings.

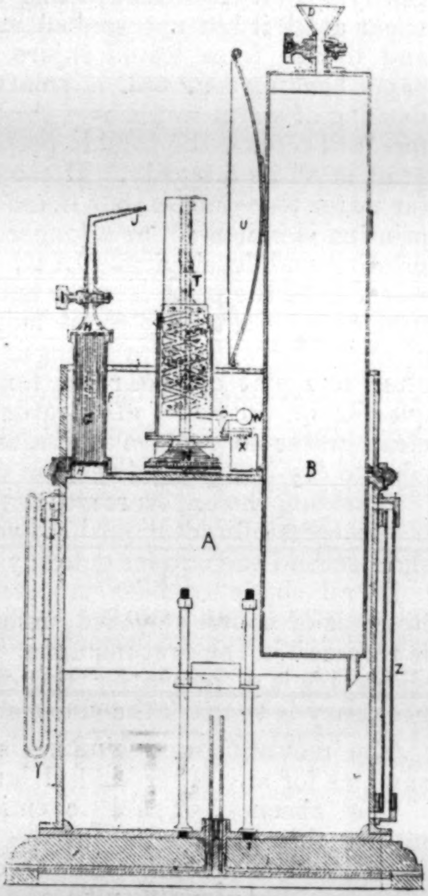
I believe there is a gentleman now alive, whose age must be fourscore, who asserts that his father invented dissolving views. Perhaps this same gentleman can father saturators, or they may have been used by Dædalus to illuminate the Cretan labyrinth, or even used in the Pyramids of Thebes, for all we know.

Certain it is that the present epoch is not the first in which such apparatus has figured.

Below is an illustration of a very complete limelight apparatus, invented and patented, I believe, in the fifties by a Mr. Hobson, and is reduced from the specification drawing which I have found amongst my papers. As will be seen from the details, it was far more perfect than many of the supposed new ones.

It had attached a pressure gauge, by which the pressure inside could be ascertained, and it had a second gauge to indicate the height of the fluid it contained, there was a most ingenious clock-work mechanism for rotating and raising the lime, which prevented it from becoming pitted. There was also connected with this a racket and prawl, by which the lime was adjusted automatically towards the jet to compensate for wear. The mixing chamber was filled with wire gauze to prevent ignition of the gases inside, a tap being fitted to the foot of the jet for regulating the flow of the gases; there was also a shield or protector behind the lime.

About thirty years back I used a somewhat similar instrument as a carburetter in my laboratory, both for blow-pipe analysis and for chemical and optical experiments.



A B Chambers for holding fluid.

D Tunnel for filling.

E Tap for opening pipe leading to chamber.

F Mixing chamber.

G Wire gauze.

H Inlets to mixing chamber.

I Single valve or tap for regulating flow of gases to lime.

J Nipple of jet.

N Clockwork.

T Lime cylinder.

U Shield.

W X Rack and prawl for advancing lime towards nipple of jet.

Y Pressure gauge.

Z Gauge for indicating height of fluid in saturator.

I have also used it in the same way as was devised by Mr. Gurney, *i.e.*, filled the case with water and then passed the mixed gases through same, and allowed the gases to bubble up out of the top of the water and into the jet. Should the flame from any cause run back into the case, the water formed a complete barrier against its re-entering the gas bag."

—:o:—

The Carbon Process for Lantern Slides.

(*Continued from page* 153.)

By Duncan Moore.

The print now being attached to the glass, put it on one side and proceed with the next print, laying it face down on the one previously done until a small heap has accumulated; leave them so for a quarter of an hour or twenty minutes to set, then begin the development by placing a print and glass in warm water, glass side downwards, wait until the colouring matter oozes out from the edges of the paper, which it will in a minute or two, according to the warmth of the water. When this takes place, take hold of one corner of the paper and gently strip it off without using any force, if it sticks at all it has not soaked sufficiently long, and to use force would injure the film. The paper backing removed, a smart and plentiful dashing of warm water over the pigmented surface will remove the soluble parts and leave the print in all its integrity. If too dark, use hotter water to reduce it, but if too light, a longer printing is indicated, or a longer time between printing and developing. In all cases apply the water until the print is clear and entirely free from crapiness, then place it face up in a dish of alum and water of a strength of an ounce of alum to a pint of water for ten minutes or a quarter of an hour, afterwards rinse well in clean water to remove the alum, and set on edge to dry in a place free from dust.

Providing the exposure and development have been successfully accomplished, we have a lantern slide second to none for delicacy and brilliance.

In all single transfer processes the carbon image is of course reversed, unless the negative is reversed in the first instance. With lantern slides this is of no matter, the only precaution necessary is to mark the slides accordingly.

The mounting and binding is precisely the same as for any other kind of lantern slide.

The absence of all chemical treatment makes this process one of the most simple, as well as most permanent. Once get the right exposure—not very difficult—and the rest is plain sailing. Where the beginner is most likely to fail, providing the exposure has been correct, is in stripping the paper from the pigment after transferring; if done at too early a stage, partial sticking will result, and the delicate carbon image will be damaged. Again, in squeegeeing the tissue into contact with the glass, if done too roughly or imperfectly, enclosing air bubbles, mischief will occur; also careful adjustment of the tissue on the slide glass, especially with architectural subjects, to ensure their being upright on the screen. Too dark prints may be improved by the free use of hot water, and too light ones, provided they have been sufficiently exposed to secure detail, may be darkened by any suitable dye.

When the amateur has mastered the process, he may make a little diversion for himself in the following manner. Provide perfectly clean lantern glasses, and coat them with a very strong, warm solution of clear gelatine, to which a little liquid china ink has been added; lay them on a perfectly level surface to dry, then place these dried and gelatine coated plates in a solution (1½ to 20) of bichromate of potash for five minutes and dry in the dark. These plates can now be used in the printing frame in contact with a negative like an ordinary lantern plate, but exposed and developed in a similar manner to the tissue; of course this being a direct and not a transfer process, no stripping is required, the film of sensitized gelatine being already on the plate, the image will be right way about, as in most other printing processes. Owing to the small quantity of colouring matter—just sufficient to see the image is all there, and properly developed — its intensity and colour must be added by brushing over it suitable analine dyes with a soft brush afterwards.

The artistic abilities of the operator will now have to be exercised to colour the picture (placed on a retouching desk or similar contrivance) suitably to sufficient depth of tint, beginning with the lightest and most delicate colours, and finishing with the more pronounced ones, a clean brush being used for each colour, and letting one tint dry before the application of a second.

It must be borne in mind a carbon picture differs from other kinds in the image being formed from different thicknesses of the same tint, the highest light being absolutely bare glass without a trace of gelatine on them, so the application of a dye stains the image equally throughout, and where there is little gelatine there is little colour no matter how strong the dye may be, and where there is considerable thickness, as in the deepest shadows we have deep colouring proportionate to the amount of gelatine. This peculiarity makes a carbon transparency by far the best of any kind for reproductions and enlargement, and when the colouring matter is of a transparent nature, the richness of the image is unsurpassed.

—:o:—

Transparencies for Decorative Purposes.

By George Kilburn.

I have often wondered why those professional photographers who are often deploring the bad state of their profession do not strike out into some other branch of business, and introduce something new or novel that will catch the public eye. In the district in which I reside not one makes and offers for sale lantern slides or transparencies for decorative purposes. Surely this branch alone, which has found so much favour of late with the public, could, if properly manipulated, be made to bring in something lucrative, and thus add to their permanent benefit.

Why not take negatives of all the public buildings, exterior and interior when possible, and from these make lantern slides, and exhibit same for sale, which, if properly arranged in the window, could be made a source of nightly attraction?

Another source from which something pecuniary could be gained is by making for sale large sized transparencies for decorative purposes. This class of pictures was suggested to me when visiting at a friend's house, when I noticed a window screen made to supplant the once popular short venetian blind.

A long piece of glass, same width as the window and about twenty inches wide, is framed similar to a picture. On the one referred to there was painted in the centre a pretty landscape scene. The thought struck me on seeing this, why not substitute this with some good photograph? Any kind of picture could be introduced, whether landscape or portrait, either large or small, just as individual fancy might lead. A pretty screen or door panel would be got by putting, say, a view of the house occupied as a centre piece, and portraits of the members of the family circle nicely arranged around. In the absence of such a group, a series of local views, or scenes of travel, according to taste. In the making of such a screen there is plenty of scope for individual taste in arrangement.

The question comes next, by what process are the pictures to be placed into the sheet of glass? In answer to that question I will mention three methods, all of which I have worked successfully myself. First, there is the carbon or autotype process. The tissue can be bought ready sensitised, or one can sensitise their own as it is required. After the necessary exposure, it is developed on Sawyer's flexible temporary supports, and afterwards transferred to its final support. Next we have the transferrotype tissue, as sold by the Eastman's Photo Material Co. This beautiful process lends itself most readily for this purpose; it is easy to work and certain in the results. The third method is the Cresco-Fylmo process. In this we have simplicity simplified. All that is required is to make the transparency on a transparency plate, and immerse in the solution according to directions, and float it on to its final resting place, and presto! it is done. This latter process lends itself to another class of work, which ought to prove profitable, viz., pictures on opal. These have a special charm of their own when nicely done. They can be made by any of these processes. I trust these few hints will prove beneficial to some struggling professional, and prove also useful so those amateurs who are desiring something new or novel.

——:o:——

Re-charging Ether Saturators.

By E. D. Bartlett.

There can be little doubt that the "saturator" has a grand future before it, and from what has appeared in the Optical Magic Lantern Journal from time to time, it shows that the saturator in its modern form bids fair to entirely supersede the old form of blow-through and mixed jets with two cylinders, as, although in the mixed jet some say that the light obtained is much brighter than that of the saturator, still I do not think the small percentage of light obtained completely makes up for the extra weight of the two cylinders.

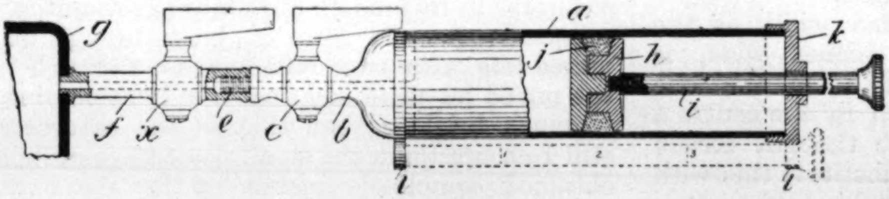
As I have used the saturator since it has come out in its present form, in many ways, places, and for various purposes, I have often found the most difficult part about them to be the filling, which, to my mind, seems to be attended with the greatest risk, and, in my opinion, likely to lead to serious consequences in the hands of negligent persons.

I have several times tried to imagine what would be the consequences if, in the height of a lantern exhibition, the supply of ether in the saturator were to run short. What should I do under these circumstances? The saturator becomes hot in the lantern, and as soon as the ether is brought near it in its liquid state the heat from the heated saturator causes it rapidly to evaporate, and hence to fill our saturator we have to go somewhere in the garden—a place where it is not always an easy matter to see, let alone keep a light burning. To obviate that I contrived an arrangement which I found enabled me not only to overcome the difficulties which I have stated, but which even gives me the power to fill my saturator whilst burning and in the lantern. Although this is not often required to be done, it is nice to know that if we are ever in such a predicament we have the means at hand by which this may be overcome.

During the early part of the year a boating party was arranged to go up the River Lea, and as there was no moon to light us up on our return journey, I thought it would be a capital idea to put my saturator filling arrangement to the test by having a small search light in the boat.

Until I possessed a saturator I had given up all idea of using a search light on a small boat as two cylinders would be uncomfortably heavy. The search light was constructed out of a theatrical lime-light box, as shown in the pages of this journal in the January number of 1893, the swivel arrangement formed by the gas joint giving an admirable means of directing the light.

The search light turned out a thorough success, and much enjoyment was experienced by those in the boat, as we were enabled to see all the craft on the river, it also supplying a splendid means of lighting the locks to manipulate the boat.



By means of the saturator filler I was enabled to keep my saturator alight for a number of hours, supplying it from time to time with a fresh supply of ether without any danger; the gas being at a higher pressure than that required for ordinary lantern purposes necessitated using more ether than usual. The accompanying drawing and description will, I think, enable anyone to make one, or have one made to the size which they think suits them best. The saturator filler consists mainly of a cylindrical tube (A), having at the one end (B) a tap (C) provided with a screwed union piece (E), which screws into an adapter piece (F), it also being screwed into the chamber of the saturator (G), and being provided with a tap (X) likewise. Only a portion of the outer casing of the saturator is shown. Working in the cylinder is an ether tight plunger (H), fitted with a rod (L), allowing the plunger to be moved to and fro. The plunger is preferably made of gun-metal, and provided with a ring of vulcanised fibre, india-rubber being of no use, as oily matter cannot be used as a lubricator on account of the ether destroying its properties by dissolving it away. If the cylinder be turned true and smooth, as well as the vulcanised fibre ring, there should be no trouble with regard to it. To fill the saturator filler, either draw in the amount by suction, or unscrew the cap (K) and withdraw the plunger, and, having previously turned off tap (C), fill up the cylinder; then, by again inserting the plunger and screwing on the cap (K), the filler is ready for use.

To charge the saturator, all that is required to be done is to connect the filler to the adapter piece (F) by the screwed nipple (E), turn on both taps (C and X), and force into your saturator chamber the amount of ether required. When this is done turn off both taps, and then unscrew the filler from the adapter piece (F), being careful that the tap (X) is turned off before disconnecting the filler. I have found it convenient for carrying to have the rod (I) arranged to unscrew from the plunger and placed in two lugs (LL), formed on the casing (A) of the saturator filler, as shown in the dotted position.

To give some idea of the amount of ether injected into the saturator, I have formed a series of markings, and had them numbered, thereby allowing me to see exactly how far I have forced the plunger in, and also the amount of ether with it. The whole thing takes up very little room, and would form a valuable addition to a lanternist's kit. With the use of this saturator filler an uninterrupted light can be obtained, thus putting one on an equal with the mixed jets and cylinders.

——:o:——

Musings on Lantern Topics.

By The Showman.

About this time of the year ironmongers, mindful of the shortening days, display lamps in their windows in place of gardening implements; lanternists who possess apparatus begin to think about their first exhibition for the season; and those who do not, but have resolved at the end of last season that they would purchase an outfit for next season, begin to count their shekels, to haunt optician's windows, and to ponder the matter generally. A paragraph in a paper recently stated that the lantern of the future was undoubtedly the single lantern.

Seeing the numberless new forms of single lanterns lately introduced, the writer of the paragraph referred to was doubtless correct according to his lights; but, as many of these lanterns are the subjects of patents, the general result, from the purchaser's point of view, has been to bolster up the price of the single lantern. Few, I think, would care to purchase an odd looking combination of metal body and bellows front, when a handsome brass-fronted mahogany body bi-unial can be had for the same price, especially when the greater convenience in slide changing is remembered.

At last a collapsing lantern has been brought out, fitted with a respectable slide stage of the usual pattern. Hitherto these lanterns have generally been fitted with two flat springs standing vertically, and fixed to a piece of wood. This arrangement may or may not have sufficed with a carrier, but when framed slides had to be exhibited was quite useless, owing to the difficulty of getting the slides into place.

Framed slides are not often met with perhaps, and the reason is not far to seek, for such is the inferiority of the slides usually met with, that thousands are not worth their cover glasses, and of these thousands, hundreds again are not worth the strips with which they are bound; so that the owners of such would not be likely to protect them with neat mahogany frames. Is it not possible that a reaction from all this rubbish will soon set in, and that lanternists will prefer soon to own fifty really first-class slides rather than a thousand indifferent ones? Under such altered circumstances, it is not too much to say that framed slides will become the rule rather than the exception.

There is a very excellent way of changing unframed slides in a single lantern, which I do not remember to have ever seen referred to in print, and the apparatus can be cheaply purchased or made by any amateur. Procure two single carriers, or, failing them, take two ordinary photo blocks, and after glueing in the loose end, cut a slot on one side with a narrow mortice chisel, so as to allow a slide to pass down into place in the centre. When one carrier is supporting a slide in the lantern stage, the operator has the other free to get ready the next slide in; and to change the slide, close the flashing shutter on the objective, remove the carrier from the lantern, put the other one in its place, and open the shutter again. All this can be done in far less time than it takes to write down, and there is no fear of shaking the slide which is showing when removing the other one from the carrier, neither is it necessary to finger-mark the slides, as the carrier can be emptied by inverting it. It is well to place some sheepskin or felt washers under the heads of the screws which keep the spring plate in position, unscrewing them for that purpose, so that the plate shall touch the carrier without gripping it too firmly. Lastly, if this system be worked in conjunction with a runner and stop, the centering on the screen is reliable.

No genius has yet brought out a gas cylinder with the square on the valve spindle end female instead of male. Were this so, in the absence of the right key, an ordinary railway key might be utilised, or, failing that, a piece of iron or steel bar with the end hammered or filed up square. In concluding this chapter of "musings," let me remind lanternists that "If a thing is worth doing, it is worth doing well."

——:o:——

The Lanternist's Den.—XV.

By C. E. Rendle.

How to Build a Bi-Unial.—VIII.

With a rough file clean the sand (if any) from the castings of the draw-tube flanges. An external thread will have to be cut on straightedge of each of the largest of these, and fitted to screw into the front plate (Fig. XXII.) The O.G. part of the casting to be then trued up and planished. Also cut internal threads in the smaller ones to take the mounts for the objectives, and afterwards finished off. The tubes, four in number, should each be about 3 in. or 3¼ in. long, and when purchasing see that the smaller fits tightly into the larger; for if not, by the time they are finished, the one will fall in and out the other, and so render them useless.

Next proceed in soldering these tubes into the flanges. The tighter they fit the better, the worker taking care that they are true and upright before fixing. It will be found necessary to examine the insides of tubes, clearing away any superflous solder or roughness in the metal.

This having been done, screw into the vice a piece of wood (square preferred) which fits tightly into the smaller tube. By this means the work can be held sufficiently rigid and without fear of its being marred, to allow of its being accurately eased into the larger tube, by the action of draw filing, viz.:—Take a 6 in. extra superfine flat file, hold it in both hands, spokeshave fashion; then drawing it to and fro along the tube, slowly and regularly, until it fits into the larger one easy enough to make it workable. This is by far the best way of letting short lengths of metal one into the other. A higher finish, of course, could be given them, but is not recommended, and if the above method is adopted it will be years before alteration is wanted. The front rim of flange can now be finished on lathe, and either cleaned up with the fine emery or burnished, as taste may direct. Be particular that the rim only be lacquered, and note the parts that have been drawn filed. With the larger or outer tube, it is different, for this is mounted on the lathe and finished all round by either planishing or emery, and afterwards lacquered. The reader is advised, before commencing this tube fitting business, to procure his lens jackets, which are made in standard sizes, and into which can be slipped, at a moment's notice, objectives of any *foci*. This pair of mounts will cost 30s. to 40s.

The focal lengths of the tubes here described will be found sufficient for most purposes, but when desirable they can be extended by introducing an intermediate length between.

The bolts and nuts for the front stages go a long way towards embellishing the apparatus, and although those of rougher make and finish would answer the purpose equally well, it seems the desire of all lanternists that the writer has come into contact with, be they amateur or professional, to give an air of respectability to their fit up. Moreover, as it is as easy to accomplish the job in a workmanlike manner as to disregard its after appearance, we may be better satisfied by being painstaking. For our purpose we want eight of Fig. XXIV., eight of Fig. XXV., and six of Fig. XXVI.; twenty-two in all. The cost of the complete sets, ready finished, can be estimated at from 15s. to 17s. 6d. Certainly a consideration in lantern building, but not too much when the amount of work is considered.

We begin with the spring plate screw, which is the simplest. (Fig. XXIV.) Its purpose is a double one, especially when spiral springs are used. It is first passed through the front plate, then a spring placed on it before screwing into spring plate. It will be obvious, that not only does it keep the front plates in position, but carriers also, when in work. Place boss of casting (C) in chuck, and turn straight pillar (A) $\frac{1}{4}$ in. in diameter and $1\frac{1}{8}$ in. long. At the end (B), turn about $\frac{1}{8}$ in. to $\frac{3}{16}$ in. in diameter, and screw tap it to fit thread in spring plate. Reverse in chuck and turn boss (C), finishing the flat edge with the milling wheel, front and edge only to be lacquered. Fig. XXV. is in two parts, the bolt (A) and nut (B). The bolt is $2\frac{1}{2}$ in. long, and $\frac{1}{4}$ in. thick, with a stop flange (C) at one end $\frac{1}{2}$ in. in diameter. The rod must be tapped about $\frac{3}{4}$ in. up. Nut (B) to be drilled and tapped size of thread on bolt, afterwards turning to pattern, which can be made effective with a little care. It will be found convenient in turning these nuts to make a screw to fit them from a piece of brass rod, fixing securely in the centering chuck. The nuts can be run on and off this at will, thus saving much time. Fig. XXVI. is in three parts, and at one end of this screwed pillar is a disc (A) $\frac{1}{16}$ in. thick and 1 in. in diameter. Through this, drill three small holes to take $\frac{3}{8}$ in. brass wood screws. The pillar, $1\frac{1}{4}$ in. long and $\frac{1}{4}$ in. thick, is tapped its entire length, same thread as used for Fig. XXV. A screwed washer (B) is next made, $1\frac{1}{4}$ in. diameter and $\frac{3}{16}$ in. thick, drilled and tapped size of above and finished with a milled edge, and lacquered. The nut is made in the same way as the others, only, be it remembered, is double the size, so when finished is, say $1\frac{1}{4}$ in. in diameter by $\frac{1}{2}$ in. in thickness, whilst, as above stated, six of this form may be made, only four of the washers are needed, the two centre ones being screwed down tight; length of pillar also in these two may be somewhat shorter. The pillars of Fig. XXVI. can now be fixed to body of lantern, and in doing this be particular in getting them in their exact positions.

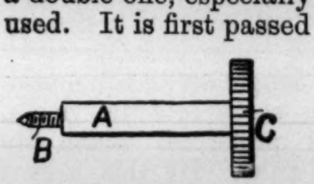


Fig. XXIV.

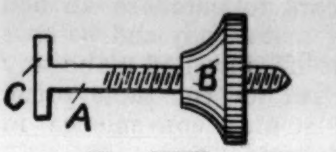


Fig. XXV.

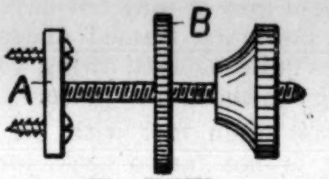


Fig. XXVI.

The hinged plates with condenser cell attachments should be laid on front, with the pillars through their respective holes, viz., two through centre plate, and one through each of the extreme corner holes. With a black lead pencil mark the position of the two middle ones. Remove the plate, and fix them to the woodwork with the $\frac{3}{8}$ in. screws. Now replace the plates, screw down nuts on the two fixed pillars, and so make the centre plate a fixture. It can now be ascertained whether the top and bottom plates are in their places by trying their movements. The condenser cell should pass in and out of holes in woodwork without touching, and if this is so the corner pillars can be marked and fixed. This having been done, place the washers on pillars, and run them down to bottom of screw, drop over the plate, and put nut on outside. The action will now readily be understood. A moment's pause for demonstration :—

Let us suppose the lantern is being got ready for exhibition. The top and bottom plates have each to be brought out to an angle, according to distance from the screen. To do this bring nuts to tops of screws, and send the washers to the bottom. The plates will now move with ease, and when the apex of the lenses has been decided upon, which is ascertained by the movement of top and bottom plates, screw down the nuts on front, and screw up washer to back, and so hold it in position.

The springs generally used for the class of spring plate described are of flatted steel, but unless they are evenly tempered they prove a nuisance, and break, of course, just at the most inopportune time. I would, therefore, advise my amateur friends to use springs of spiral form as mentioned above, and which can be easily made, by coiling hard brass wire round a spit the size of pillar Fig. XXIV., and afterwards cut to the required length with the nippers.

(To be concluded).

——:o:——

Tips for Lanternists.—No. III.

By Saturator.

With the "Safety" or "Blow-through" and "Mixed chamber" jets two gases are required, and these are conveyed to the nipple by separate pipes. In the first form of jet they do not come in contact with each other until the nozzle is reached, but in the second they are mixed in a chamber and burnt at one nipple.

The left hand pipe is used for conveying the hydrogen gas, or gas from house supply, and the short piece of pipe at the back of pillar is always bronzed or blacked, whilst that conveying the oxygen is bright.

This should always be borne in mind when connecting up. No harm would occur by making a wrong connection with the safety jet, but an accident might happen with the mixed jet, especially if using gas bags and old pipes.

Both above forms of jets are fitted either with thumb taps, lever taps, or screw valves. I prefer the lever taps for blow-through jet, as giving a better command over the gases, and for a mixed jet, screw valves are much the best, especially for those who have not had much experience; with these the gases can be easily balanced.

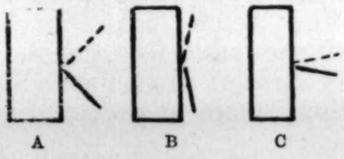
It is a mistaken idea to suppose there is any danger attending the use of either of these lights when the gases are obtained from cylinders; the worst that could happen would be a snapping at the nozzle of jet or the blowing off of the india-rubber tubing. In the case of the safety jet, even the latter could not occur, as the gases do not mix at all until they are ignited; sometimes the hydrogen does creep down into the oxygen pipe and snap, if the latter be turned on too quickly; therefore, the gases should always be turned on slowly, and when turned down for an interval leave on a little oxygen.

It ought to be clearly understood that when the most brilliant light is obtained the gases are not being burnt in their combining proportions of two to one; it is as soon as these proportions are reached that the light decreases and a violent snapping in the chamber occurs, five feet of hydrogen being required for about four feet of oxygen.

When using gas bags great care should be exercised in seeing that both are equally weighted, and a lecture ought never to be commenced with one bag full and the other only partially so. Neither should they be used until quite empty, as both bags are seldom exhausted at the same moment.

If one bag be allowed to become entirely exhausted before the other, the gas remaining is forced round the opposite pipe—of course in a mixed jet—and with it the flame into the practically empty bag, and an explosion is the result.

The angle at which the gases impinge upon the lime is important. Mr. Chadwick recommends an angle of 45°, as shown in A, as being the best. If too slanting, as at B, the impact would be imperfect, and a large amount of gas used for a small light, whilst the angle at C is too acute, and the nipple of the jet would come within the focus of condenser and show as a shadow upon the screen; in this case, too, the lime would soon become pitted, and the flame most likely fly back and crack condenser.



BLOW-THROUGH OR SAFETY JET.

The light from a blow-through or safety jet ranges in brilliancy from 150 to 250 candles, and ought to give a good picture up to about eighteen feet diameter, but this will depend largely upon the density of slide.

They are made with nozzles varying slightly in form.

Fig. I. is the style mostly in use. This has the lip of hydrogen pipe projecting towards the lime. In Fig. II. it will be observed the lip of H is placed on the reverse side. This form of jet gives a rather better light, but I cannot say exactly how much, as I have not yet completed my experiments.

Fig. III. gives less light than those before mentioned, and Fig. IV. is practically a mixed chamber jet.

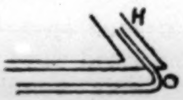


Fig. I.

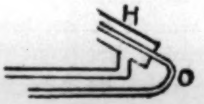


Fig. II.

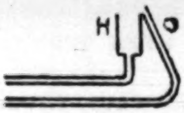


Fig. III.

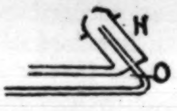


Fig. IV.

The hydrogen issues from pipe H in a fairly large stream at a comparatively low pressure, and burns pretty much the same as house gas would do if the burner were removed—(and this reminds me that it is always best to unscrew the burner when using house gas, and fix on a bend. Jones's patent connectors do excellently; they prevent the india-rubber tubing from kinking, besides they allow a good flow of gas)—whilst the oxygen is forced through the small orifice O at some pressure, and is blown through the centre of the H flame, which it at once reduces, and makes the lime incandescent.

If the nozzle of O pipe be terminated too far inside pipe H, it will soon become clogged with pieces of lime which constantly drop off the incandescent part, while if carried too far beyond, the O rushes through the H flame, and impinges upon the lime before mixing, and there shows as a black spot.

With all above forms of jets the most brilliant light is obtained with an excess of hydrogen flame showing. I mention this as I have repeatedly noticed beginners constantly turn off the hydrogen as soon as it showed to excess, and consequently impaired their light.

The following will be found a simple way of obtaining a good light:—Fix the lime on lime spindle, and move the carrier back until the lime is about half an inch away from the nipple, turn the H full on, and slowly turn on O until a black spot begins to show upon the lime; remove the lime a trifle further back, and if the spot disappears, turn on a little more O, and repeat this so long as the light improves; then, if there is a large excess of H, gradually turn off until you see it affects the quality of the light.

The safety jet can be used with: (1) both gases from cylinders or bags; (2) with H from house supply, and O from cylinder or bag.

When using bags it is a mistake to overweight them; about 30 lbs. is sufficient for this form of jet, as it does not work so well with a great pressure upon the bags.

A, pillar, which slides on to rod of lime tray, and is clamped by thumbscrew B; this pillar should be turned out of a single piece of metal. C, chair, carrying lime gear; by loosening the screw the lime can be adjusted to the nipple of jet. D, spindle for holding lime; E, rod for rotating and raising same; H, hydrogen pipe; O, oxygen pipe; Y, piece connecting two pipes together. This is best when silver soldered; soft soldered joints are liable to come apart with the excessive heat, which generally happens when least expected. T, thumb taps for regulating supply of gases to jet.

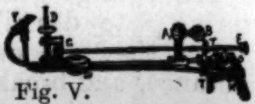


Fig. V.

MIXED CHAMBER JET.

A mixed jet is used with both gases under pressure, either in cylinders or bags; when using the latter, about 112 lbs. will be found ample.

Experienced operators have used house gas direct from the main when there is sufficient pressure behind it.

The chamber of a mixed jet requires to be perfectly smooth, and without any acute angles, as the least unevenness is likely to cause a singing noise, which is always most unpleasant. No gauze or other packing is required, and it does not improve the light in the least, neither would it stay an explosion. I believe the theory is that a flame will not pass back through fine wire gauze, as the heat generated on the side next the light is dissipated as soon as formed, and that the under side is consequently kept cool below the point of ignition, this may be true, and a theory that answers for a miner's lamp, but the area of a piece of gauze within the chamber is comparatively small when compared with the other, and the heat given off by a combination of H and O is intense, consequently the chamber itself soon becomes unbearably hot, and so does the gauze inside. Hence the flame will walk through it as if the chamber were empty.

When using a mixed jet, turn on H and apply light; then turn on O, and gradually increase the supply of both so long as the light improves and there is no hissing; this will happen when the jet is not at its best if the gases are not balanced.

The lime will require to be close up to the nipple in some and about one-eight of an inch in others, but this depends upon the bore of jet and quality of lime. Hard limes are required for mixed jets.

A, B, C, D, E, H, O correspond with the same parts and letters as in the preceding illustration. M, mixing chamber, in which the two gases are mixed previous to being burnt at nipple; N′ collar which screws down on to M, and clamps down N; it is usual to have a leather washer between, so as to make a perfectly gas-tight joint. NN′ are sometimes made in a single piece, but it is better to have the nipple N′ made separately, as then this can be changed for one of a larger bore if needed.

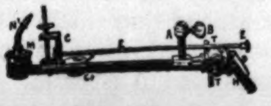


Fig. VI.

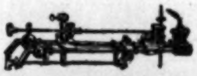


Fig. VII.

Fig. VII. shows a mixed jet with a cut-off tap.

Fig. VIII. an interchangeable jet, which can be used as a mixed chamber jet, or a blow-through jet.

In the illustration (Fig. IX.) the letters refer to the following:—

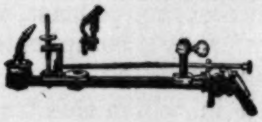


Fig. VIII.

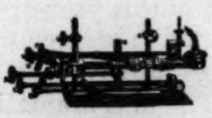


Fig. IX.

A. Rod to work the jet up or down on racked pillar A.

B. Rod and bevelled wheels working lateral screw.

C. Rod and endless screw moving the whole jet on the tray nearer to or further from the condenser.

D. Rod and screw to move the lime cylinder nearer to or further from the nipple.

E. Rod and cog-wheel adjustment for turning lime.

F. Rod with pinion at end, working in toothed wheel attached to on and off plug.

G. G. Two pillars and clamps for securing steadiness of jet. One of the numerous methods used for centering the light.

—:o:—

Modern Optical Illusions.—No. II.

By Edmund H. Wilkie,
Of the late Royal Polytechnic Institution.

I MIGHT easily multiply instances in which, by a slight alteration in the position of the glass, various curious effects may be produced, but wish now to direct your attention to an ingenious adaptation of Professor Pepper's principle lately exhibited in France.

In the Hall of Exhibition some curtains were closely drawn, and a railing ran from side to side to prevent visitors approaching too closely. After a little music to settle down the audience, the curtains parted, and a beautifully painted sea-view with a setting sun was disclosed to view.

The scene had a slightly hazy appearance owing to a piece of gauze being stretched over the entire opening, and the sides of the circular picture gradually faded into nothing on account of several circular frames of gauze being placed overlapping each other like the capes on the old-fashioned coachman's cape. After a short explanation, a figure representing a Sea Nymph rose from out of the waters and floated about, turning head over heels in a most remarkable manner, finally vanishing downwards once more. The method of production will, I think, be sufficiently apparent on reference to the sectional view (Fig. V.).

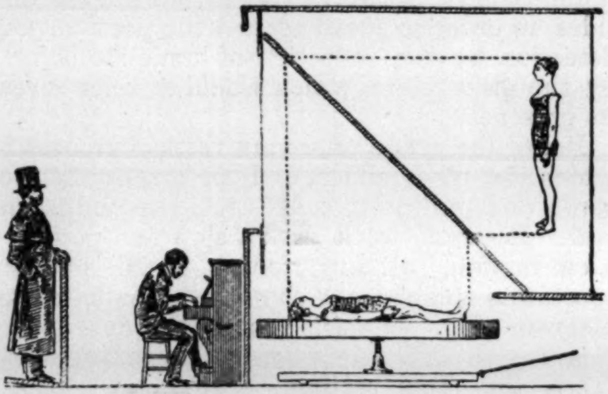


Fig. V.

There we see the inclined plate of glass and the recumbent figure as in Fig. III., but in this latter case the figure was placed on a turntable to give the effect of somersaults, and the turntable itself ran on wheels to cause the figure to rise and fall by being pushed backwards and forwards.

At the close of one of the Christmas entertainments at the Royal Polytechnic Institution, a very remarkable adaptation of the ghost was exhibited under the title of "Asmodeus, or the Bottle Imp." The arrangement for reflection was the same as in the case of the statue mentioned last month, but the figure instead of being directly reflected, was first received on a convex mirror, and thus reduced to about fifteen inches in height. This image formed by the mirror was reflected on to a spot occupied by a large champagne bottle standing on a table (one of those large "dummy" bottles, about thirty inches high, used by wine merchants to decorate their windows), and the effect as the diminutive figure jumped up and down, apparently inside the bottle, caused much amusement.

In spiritual seances one of the most ordinary manifestations is the levitation of solid or material objects. How this is accomplished I will not pretend to explain, but the same effect can easily be obtained on the stage by very simple means, as I shall endeavour to show.

For the object we will choose a chair. The stage is prepared by having a long narrow piece cut out just sufficiently large to allow a plate of transparent glass to travel up and down on edge through it, the plate being the width of the seat of the chair it is proposed to float.

As the glass in this case is not required for reflection it may be placed at any angle with regard to the audience, the best possible position being with its face to the footlights. Considering the latter, it would be better if they were dispensed with altogether in this case, and all the illumination allowed to come from the top and sides, in order to guard against the possibility of detection by the reflection of luminous objects by the glass plate, which would at once reveal its presence.

Below the stage there are vertical grooves in which the plate slides, and an arrangement of cords and pulleys to cause it to rise and fall at will. It should work with a slow and perfectly even motion, as any jolting would put the spectators on the track at once. The following diagram (Fig. VI.) will render the description clear:—

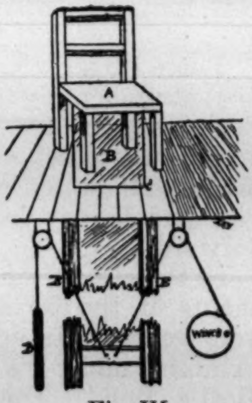


Fig. VI.

(A) is the chair resting upon the glass plate (B), which slides up and down through the cut in the stage (C), by the aid of the weight (D), being kept rigidly in place by the vertical grooves (EE).

If properly balanced on the edge of a stout plate, very heavy objects can be moved in this manner, and the writer has seen a couch, with a lady reclining upon it, elevated to a distance of about five feet above the stage, by means of a large plate extending right across a small stage and running in grooves placed behind each side-wing, the lower portion of the apparatus being the same as in the case of the chair.

Up to the present, the effects I have described have been the result of sliding plates of plain glass. Now let us, for the sake of variety, turn our attention for a time to illusions, depending for their success upon plates of reflecting silvered glass.

In 1879 Professor Pepper, in conjunction with Mr. Walker, produced at the old Polytechnic, and afterwards in other places, including the chief cities in Australia, an optical effect, which they entitled "Metempsychosis." It was considered to be one of the most perfect illusions ever brought before the public, and when introduced in dramatic sketches caused much surprise and amusement. By means of this apparatus a variety of changes, such as a living man appearing in a previously empty arm chair, a basket of oranges changing into pots of marmalade, &c., &c., were accomplished, the latter feat being exceedingly popular, possibly on account of the practice of distributing the pots amongst the audience.

One puzzling change was that of a woman to a man. I do not know if the lady was the "New Woman" we hear so much about lately, but in this year of 1894, in costume at least, we should not require any very complicated apparatus to effect the transformation.

The first dramatic sketch in which this truly marvellous apparatus was used was entitled "The Artist's Dream," and on the rise of the curtain, the stage appeared set out as an artist's studio, the walls being hung with the usual properties we should expect to find in such a place. On the O.P side of the scene (Fig. VII.), near the front, stood a large easel, supporting a partly-finished outline of a head; further up the stage, on the same side, an antique carved wood table, of the well-known Wardour Street design, was standing, upon which rested a large shaded lamp, which was supposed to illuminate the room. On the other side, the space was occupied by chairs, &c.

In the centre of the back appeared a small chamber, with a large arm chair at the back. The floor of this apartment was raised about three feet above the level of the stage, and was approached by a short flight of stairs (Fig. VII). Originally, a light was placed under this chamber, to show to the audience that nothing in the nature of a trap door was used, although, in witnessing illusions, we must never allow our vigilance to be relaxed for a moment by any appearance of candour on the part of the arch-deceiver in charge. However, in this case it was perfectly honest, as no traps were necessary.

The scene reproduced is photographed from a drawing of the stage as set out to introduce the illusion in the late Mr. George Buckland's entertainment, entitled: "Curried Prawns."

In the case of the "Artist's Dream," immediately on the rise of the curtain, the usual stage business took place: a servant coming in to dust and arrange the room, being shortly followed by the artist himself. Presently a knock on the door preluded the entrance of two porters, each carrying a bundle of something, done up in a cloth, and which, on being opened, exposed to view the two halves of a lay figure, made of papier mache.

The lower half being seated in a chair, was joined to the upper by means of a large wooden peg. Now to disabuse the minds of the beholders of any idea of little boys being concealed inside, a large trap door was made in that portion of the figure's anatomy usually occupied in the human subject by the organs of digestion, and this was now opened to show that the figure was really hollow.

A dialogue now occurred between the artist and the porters as to the best place to put the figure for the present, and the difficulty was finally solved by seating it in the arm chair in the little chamber at the back, where it remained in full view of everyone in the auditorium. The men then retired, the stage was slightly darkened, and the artist settled himself comfortably in a chair by the lamp, and proceeded to seek inspiration by reading the newspaper.

I do not know what he read, perhaps a political leader, but he soon felt its soothing influence, and, after nodding a few times, sunk into a profound slumber.

Then something peculiar occurred—something that arrested the breath of those inclined to nervousness.

A long tremolo sound of a weird nature was heard; a light from some point, not easily determinable, fell on the lay figure, as with a jerky mechanical motion its head moved from side to side, as if looking round the room. It then slowly arose to its feet, and walking forward, came down the steps on to the centre of the stage, where it paused for a moment.

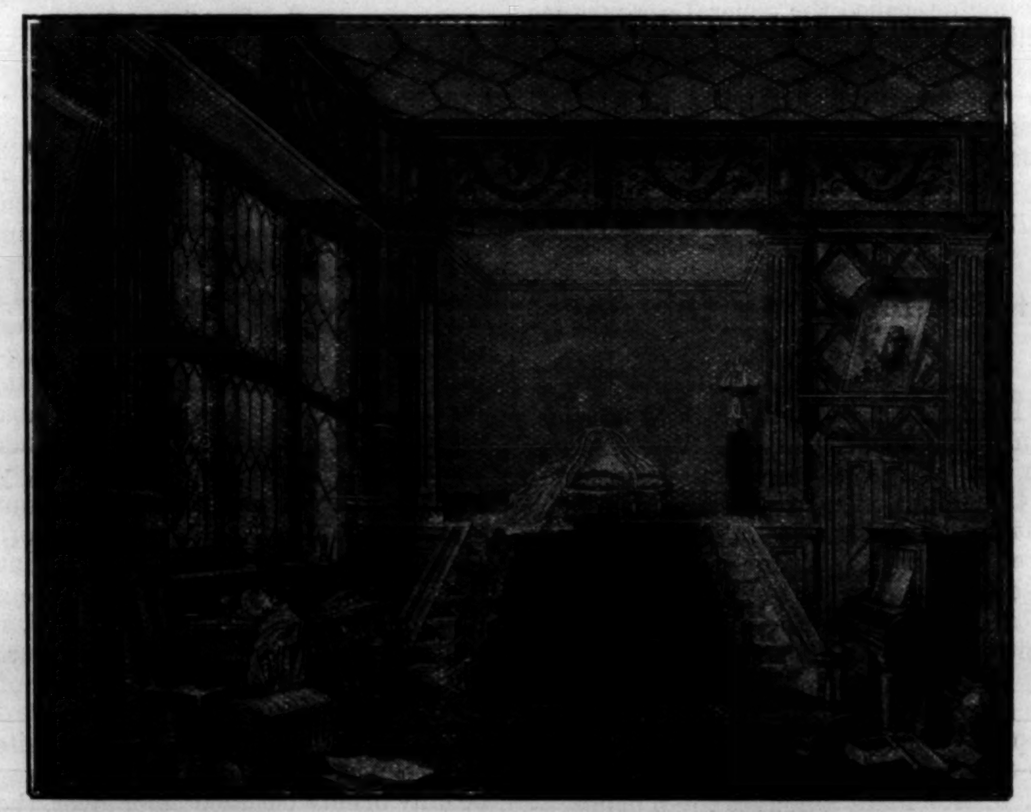


Fig. VII.

This picture was very impressive, the faint light in the little room at the back, the semi-dark stage, with the artist asleep under the warm rays of the large shaded lamp, and the lay figure standing in the centre, all its joints apparent, and bathed in a mysterious steely blue light, together with the weird musical accompaniment, formed a tableau which haunted the memory for long afterwards. The figure then turned towards the easel containing the half-finished outline, selected a piece of crayon, and proceeded to finish the drawing, after which it slowly retreated backwards up the stage, mounted the steps, and sat down in its original position in the arm chair.

After a moment's pause the artist started up with a teriffic yell, the lights were raised, and in rushed the two porters and the servant. The artist bounded up the steps into the rear apartment, and, grasping the lay figure, dragged it down to the front of the stage near the footlights, where they all seized it by the arms and legs, pulling it to pieces, after which, down came the curtain.

Now having described the general appearance of this illusion from the auditorium, let us consider the means by which all these mysteries were accomplished; but stay! methinks I see our genial editor's scissors looming in the distance, so for the present must content myself by observing:—

To be continued in our next.

——:o:——

Optical Exhibition at the Royal Aquarium.

On the 11th ult. a Photographic and Optical Exhibition was opened at the Westminster Aquarium, and at the present time is in force. It being the intention of the management to continue it until the 6th inst., those who have not yet seen it have ample time to do so. There one can see arranged, under the superintendence of Mr. E. A. Du Plat, photographs not only of the present day, but also many taken by early processes, blocks for mechanical printing, spectacles (ancient and modern), and a variety of other optical apparatus.

Several stands are tastefully arranged in the trade section, prominent amongst them being:—

Walter Tyler, of Waterloo Road, who has a perfect regiment of lanterns' slides and photographic apparatus. In addition to the Helioscopic lantern, some fine bi-unials and triples are shown.

The Platinotype Co.—A large display of prints and transparencies. Practical demonstrations being given in their process.

Curry & Paxton, Great Portland Street, shew a variety of optical and other instruments, and also the method of polishing lenses.

W. Wray, of Highgate.—Microscopes, telescopes, photographic and lantern lenses.

Airs & Co., Farringdon Road.—The Bessus plate and film holders, also a compact bi-unial, the front of which is hinged.

J. H. Dallmeyer, Ltd., Newman Street, W.—Telephoto and other lenses, cameras, and telescopes.

Bowen & Co., Clerkenwell.—Castings for optical work.

Theobald & Co., 19, Farringdon Road.—Photographic and lantern apparatus of every conceivable style, also th method of transferring their chromolitho slides.

Aston & Son, Birmingham.—Spectacles, cameras, stereoscopes, opera and other glasses.

Cresco Fylma Company, Kingston-on-Thames, give demonstrations of their process.

J. Cheney, of Beckenham, has a number of screen and background stands on show.

Platte & Witte, Birkbeck-road, Dalston.—Lanterns and also brass work for amateurs and others wishing to construct their own lanterns and other apparatus.

Many closed cases are on exhibition, containing articles of interest, and between examining pictures and apparatus, the visitor to this exhibition will be able to spend a few profitable hours.

——:o:——

A Suggestion.

By Bombastes Triple.

What a thing it is to positively bubble over with brilliant ideas, isn't it? Whether it is the effect of the warm weather, or the full moon, or both, I cannot say, but at this time of year Bombastes Triple is always prolific in magnificent plans for the future. A cynical friend says something about "slopping over being natural to shallow vessels," but he's wrong—it is exuberance of brain. Be that as it may, the fact remains that I, the great Bombastes, must do something to keep myself prominently before the minds of a forgetful public. My yearly plan hitherto has been to invent a new lantern which "is certain to supersede all other forms of projecting apparatus" (see advert.) But inventing new lanterns, even though each one in turn be "the most effective, novel, practical, convenient, and simplest form of optical lantern ever yet introduced to the public" (see any of my ads.), is somewhat expensive, and so I have determined on a plan which will not involve quite so lavish an expenditure. The proposal here made can be only briefly outlined; moreover, the parent of it, with that sweet modesty and diffidence which so well becomes him, will be quite willing to hear what others may have to suggest. All he is desirous of doing is to assist and aid the growing army of lanternists in the one particular matter of exchanging among themselves their surplus slides with a minimum of trouble. Let us, therefore, as good and true lanternists and readers of this journal, put our heads together.

No one who has much to do with lantern work or photography can avoid accumulating slides, which, although valuable in themselves, their owner has no longer any use for. Now a plan which would permit of amateur lecturers and photographers making their wants known to each other would be of real service to a great many. Take my own case. I have duplicates of nearly every slide I have ever made, many of them on subjects untouched by the trade and which, probably, would be of value to those engaged in the same sort of work as myself, if only they could get to hear of them. As an example of this the writer is at present engaged in the production of a set of slides to illustrate cross-fertilisation of flowers; perhaps there may be others at work on the same subject. By an interchange of slides the labour would be halved, and also one's ideas would be extended and widened by the transaction, and this at little or no cost at all. Again, with ordinary slides on popular subjects, when one set has done its work in any particular district, what is more desirable than that means should exist whereby it would be possible to exchange it for another set? Such exchanges as these, of course, often do take place, but I certainly think that they would, with benefit to all, be much more frequent if additional opportunities were given.

To meet this demand the writer therefore suggests the formation of an informal sort of postal club or association among amateur slide-makers. Primarily, it should be established for the exchange only of spare and superfluous slides; though, of course, members could please themselves in the matter of buying and selling. The club would be possessed of one distinctive feature, and that is that there would be no officers or subscriptions or expenses attached to it in any way. The sole property of the club, which your own Bombastes (about time he came in again, isn't it?)—having had successful lecture seasons—will provide, would be a penny exercise book. This book could be divided into two parts—one containing particulars of "slides for exchange," and the other of "slides wanted." Under suitable headings, such as architecture, science, travels, etc., all slides for disposal would be entered together with such comments and descriptive notes as the owners might see fit to insert. Thus a page in the "slides for exchange" part of the book might read thus:—

SCIENCE.

1.—Diamond Mines, Kimberley. (Showing method of obtaining diamonds, well coloured.)—Brown.

2.—Megatherium, Upper Tertiaries of South America. (Fossil Sloth, slide made from a print.)—Jones.

3.—Vesuvius in Eruption. (Showing clouds of steam, showers of ashes, etc., from a snapshot in 1886. Very effective slide.)—Robinson.

On this book reaching one of the members, say Mr. Smith, he examines the lists of subjects in which he is interested. If he has a weakness for volcanoes in eruption he enters into communication with Robinson, the address of whom Smith ascertains from the list of members at the end of the book. Very probably, too, in the "slides wanted" part, Smith would find particulars of the said Robinson's requirements, and so the process of exchange between them would be much simplified.

Having taken notes of the slides he is anxious to obtain, and also added to the various lists any he has to dispose of, Smith posts the book on to the member whose name and address appears on the list next below his own. In this fashion the lists would circulate from member to member at no greater expense than an occasional stamp. Some effective arrangement would have to be made in order to secure the prompt removal from the list of all slides as fast as they were disposed of. Robinson and Smith, once put into communication with each other, would probably continue their transactions from time to time to the benefit of both.

Again, if a member is in want of slides not to be found in the trade lists, since his requirements come under the eyes of those who are interested in various branches of slide-work, it is very likely that some member or the other could give him the necessary information. Doubtless, in several ways, considerable benefit would accrue to those into whose hands the said book would pass, whether lecturers or teachers, clergymen or others, and this without expense, trouble, or risk of loss.

In conclusion, perhaps a rough outline of the sort of instructions which would accompany the book will best explain the writer's object.

INSTRUCTIONS.

1.—The club may be known as the Slide Exchange Club.

2.—The members of it are amateurs who use or are interested in the production of slides. Their names and addresses will be found on page —.

3.—You are requested not to keep this book more than three or four days.

4.—Directly you have finished with it, please forward it by post (1d. stamp, labels will be found inside) to the name and address which appears below your own on page —.

5.—If you have slides for exchange, please enter them, with full particulars, under their proper headings.

6.—Enter any "slides wanted" in the same way in the other part of the book.

7.—The following arrangements have been made to ensure the erasing of particulars of slides, which are disposed of from the lists.

8.—A space for suggestions and comments will be found on page —.

9.—Those members whose names are indicated will please to send this book to headquarters for revision and correction instead of forwarding it on, in the usual fashion, to the next member.

Etc., etc.

This outline is necessarily incomplete, but inasmuch as the book will only pass into the hands of those who are keen about lantern matters, lengthy rules and restrictions are not needed. Sometimes, no doubt, the descriptions of slides may be rather too enthusiastic, but that will correct itself when the two members come to exchange them. And now if among the readers of the Journal there are some ten or twenty persons to whom this idea appears workable, and who will forward their names, addresses and suggestions to me, care of the editor, the great Bombastes will bring his mighty brain into play, and the experiment shall be tried.

——:o:——

Experiments for the Domestic Circle.

Let sulphuric acid be poured into a saucer upon some acetate of potass. Into another saucer put a mixture of about two parts quicklime and one of sal ammoniac, both in powder, adding to these a very small quantity of boiling water. Both saucers, while separated, will yield invisible gases; but the moment they are brought together the operator will be enveloped in very visible vapours. Muriate of soda in this experiment may be substituted for acetate of potass.

To a solution of gold add about a fourth part of ether, shake them together and wait till the fluid separates, the upper stratum or ethereal gold is then to be carefully poured off into another vessel. If any polished instrument be dipped into this solution and instantly plunged into water the surface will have a coating of pure gold. This is an economical method of preserving polished steel from rust.

Prepare a strong solution of phosphorous in sulphuric ether, and dip a piece of white silk in the solution, then when the ether has evaporated and the phosphorous begins to fume, apply a solution of nitro-muriate of gold, made by dissolving the crystals of that salt in distilled water; the silk will in an instant be covered with a splendid coat of metallic gold.

Dissolve some crystals of chloride of tin in distilled water, then dip a piece of white silk in the solution and dry it in the air. If this be now immersed in hydrogen gas, no change will be observed, but if it is exposed while wet to the same current of gas the reduction will soon commence attended with a great variety of colours, as red, yellow, orange, green, and blue variously intermixed.

Affix to a dark wall a round piece of paper an inch or two in diameter; and a little lower, at the distance of two feet on each side, make two marks, then place yourself directly opposite to the paper and hold the end of your finger before your face in such a manner that when the right eye is open it shall conceal the mark on the left and when the left eye is open the mark on the right, if you then look with both eyes to the end of your finger the paper which is not at all concealed will nevertheless disappear.

If muriate of tin, newly made, be added to a solution of indigo in sulphuric acid, the oxygen of the indigo will be absorbed and the solution instantly converted to a green. It is on the same principle that muriate of tin is employed in cleaning discoloured leather furniture, as it absorbs the oxygen and the leather is restored to its natural colour.

Write with dilute nitrate of silver which when dry will be entirely invisible, hold the paper over a vessel containing sulphate of ammonia and the writing will appear very distinct, the letters shining with the metallic brilliancy of silver.

Curious motions in liquids by heating and cooling them.—Fill a large phial with water and put into it a small quantity of powdered amber; and having previously added to the water a sufficient quantity of potash to make a solution of the same specific gravity as amber, immerse the phial in a glass of hot water, upon which a very singular internal motion will be immediately perceived—a current of the fluid will rise up the sides of the phial and another descend in the centre of it. Now take the phial out of the hot water and observe the effects of its cooling, the current will be reversed, the external one will descend and the internal one ascend. The use of the powdered amber is to make the opposite currents, into which the water is thrown, visible.

New Apparatus.

SLIDES FOR CHURCH USE.

We cannot say that we have seen clearer slides photographed from printed matter than those just to hand from Mr. Robt. H. Clark, of Royston, Herts. The slides comprise selections from the book of Common Prayer, both in English and Welsh, hymns, texts, &c. In all cases the letters are of a rich, dense black; each slide has a floral border, and are sold at 6d. plain and 9d. and 1s. coloured

SATURATORS.

The Lawson Saturator has been made a little larger than formerly, so as to enable it to burn for three hours. A feeding cup has been added to the top so as to facilitate charging with ether, and a mill-head screw added at foot of nipple in place of that which was formerly provided.

Among the improvements added to the "Gridiron" is a screw arrangement whereby the lime may be brought nearer to or further from the lime by means of a knob placed behind, all the necessary movements being controlled from the back of lantern. A new stand to slide into lantern has also been provided, whereby the light can be readily centered. We learn that this instrument is being supplied to a number of school teachers.

Mr. Timberlake has, during the past few months, been perfecting a Saturator for a bi-unial lantern, and has, after repeated trials, "pronounced it good." The various adjustments for centering the lights are simple and effective.

The Optimus Saturator, which was brought out towards the latter end of last season, remains of the same pattern as when introduced, and Messrs. Perken, Son & Rayment, being well satisfied with its perfection, are making a large stock for this season's use.

MATTHEWS' LANTERN.

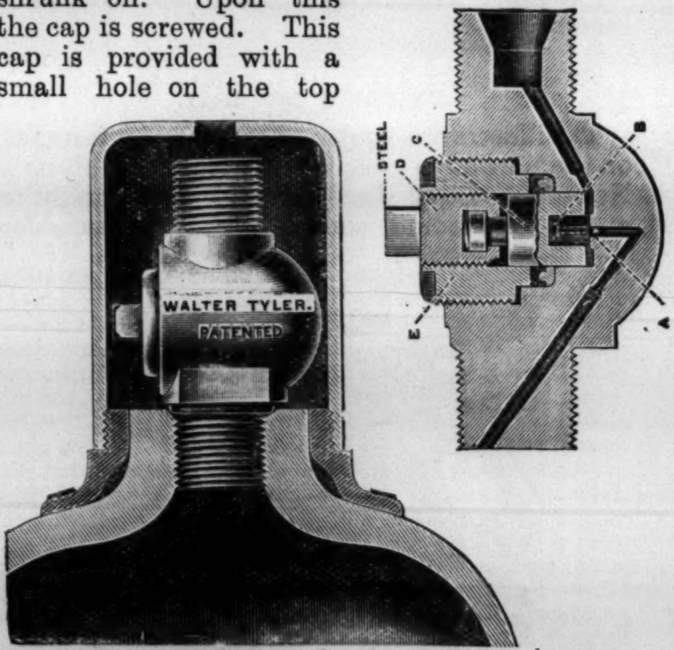
Improvements have been made in this small lantern, the aim being to make it as portable and efficient as possible. The back portion is practically a chimney with a connecting tube, which slides over the condenser. When packed up even the chimney is hinged so as to fall back and thus take up as little room as possible.

"LEVIATHAN," LONDON.

A wholesale firm, of which the above is their telegraphic address and trade mark, are introducing a number of sets of slides, both comic and otherwise. Also some very pretty slides, such as "Good-evening," "Interval of 5 minutes," &c. The letters in these slides are etched into flashed glass, and when projected on the screen appear to stand out in relief. An excellent binding strip for slides, termed "The Baynton," is to be obtained from this firm.

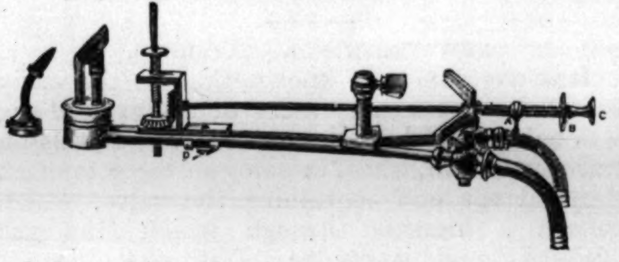
NEW VALVE FOR CYLINDERS.

It is not generally known that in the early season last year a cylinder of compressed gas was being placed in the guard's van at Euston railway-station, when, in doing so, the attendant dropped the end containing the valve, which caused a fracture through which the gas gradually made its escape. With the object of ensuring absolute safety even to the valve, a patent has been taken out for a small and compact valve which can be completely covered by a cap. Fig. I. shows the new valve in section. The button (C) carries a cap of hard vulcanite (B), through which a pin (A) passes, the point entering the gas inlet. The button plays with freedom in a slot in the upper spindle (D), and is controlled by the slightest movement thereof. When the upper spindle is open the outflow of gas may be easily regulated by the operator. Prior to use, the valves are tested to a pressure of 3,360 lbs. per square inch. The ring on the neck of the bottle (Fig. II.) is made of malleable cast iron, and is shrunk on. Upon this the cap is screwed. This cap is provided with a small hole on the top to act as a safety valve or outlet, in case from any reason or other the gas may have been not perfectly turned off. We learn that Mr. Walter Tyler, of Waterloo Road, is the special agent for these valves.

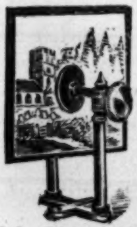


DAWKINS' "EXTERNAL ADJUSTMENT JET."

A convenient method of adjusting the distance of the lime from the jet, from the back, is one of the improvements which have been added to jets made by Messrs. W. A. Dawkins & Co., Warstone Parade, Birmingham. On the rod by which the lime is turned is a tube provided with a tri-threaded screw, on the end of which is a milled edge thumb screw. A turn of this suffices to adjust the lime when necessary, whilst the lime can be turned in the ordinary way; thus the one rod serves two purposes.



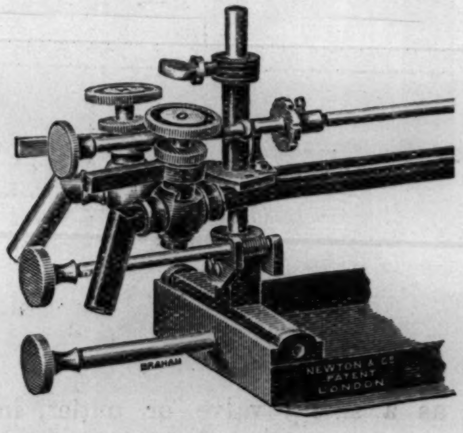
SLIDE BINDING CLAMP.



A new design of clamp is now made by the Photographic Enterprise Company, 41, Erasums Road, Birmingham. The general appearance can be ascertained from the annexed cut. This firm was, as far as we can remember, the first to introduce clamps for the purpose of binding slides.

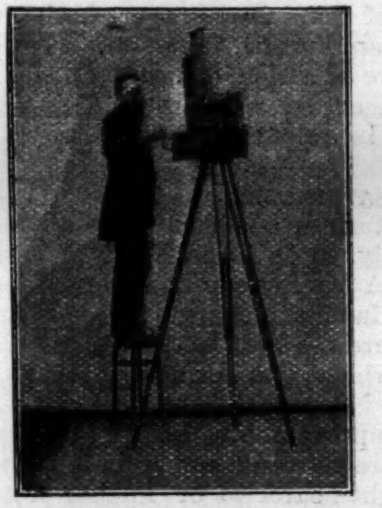
CENTERING JET TRAY.

The illustration shows an ordinary jet fastened on the new adjustable tray, patented by Messrs. Newton & Co., of Fleet Street. The upright is made to assume the requisite position for centering the light, the lower thumb screw causing the upright to be inclined at any angle, so as to raise or lower the jet, whilst the upper rotates the pin, thus causing the side adjustment to be made to the jet.



HARD LIMES (NATURAL).

Exceedingly hard and evenly turned limes will shortly be in the hands of dealers. We have tested these limes, and they give a good light, are not easily cracked, and require turning only once during several minutes.



STOCKS' LANTERN STAND AND BOX.

☞We are now enabled to give an illustration of Mr. Stocks' stand, of which we gave a description in last issue. The stand can be fixed at any height within reason, as shown.

—:o:—

Patent Intelligence.

The following list, relating to current Patent Applications, is compiled expressly for "The Optical Magic Lantern Journal" by a registered Patent Agent. For further information apply to S. Dicker, c/o "The Optical Magic Lantern Journal," 56, Chancery Lane, London, W.C.

No.	RECENT PATENT APPLICATIONS.
15819.	20 August, 1894. George Davenport. An improved curtain slide carrier for optical or magic lantern (complete specification).
16916.	5 September, 1894. Henry Taylor. An improved apparatus for manipulating lime and electric lights, and the boxes used therewith.

COMPLETE SPECIFICATIONS PRINTED.

18224 of 1893.	Suiter. Oxy-hydrogen or lime light.
15209 of 1893.	Ebert & others. Compressing gases, &c.
18623 of 1893.	Cooper. Operating lime light colours.
2365 of 1894.	Gwyer. Lime light apparatus.
12572 of 1894.	Newton. Optical lanterns.
15824 of 1894.	Matthews & Watson. Carriers for optical lanterns.
6518 of 1894.	Thorp. Slide-carriers for magic lanterns.

—:o:—

Editorial Table.

"PHOTOGRAPHIC ENLARGEMENTS: HOW TO MAKE THEM."—The third edition of this shilling book has come to hand from Messrs. Geo. Wheeler and Co., 46, King Street West, Manchester. It has been brought up to date, and treats of the subject from a practical standpoint. Those who make, or intend making enlargements, will do well to keep this book handy, for it treats of paper, apparatus, &c., in general, without any leaning towards that of any particular manufacturer.

LAKES OF KILLARNEY AND GLENGARIFF.—Mr. W. Lawrence, Dublin, has issued a set of eighty-seven lantern slides, illustrative of the above. The description given in the reading is of great interest, and the set should become a popular one.

Catalogues.—Mr. E. G. Wood, 74, Cheapside, has just issued his supplementary catalogue. Among the new sets of slides we observed "Our iron roads," "Bridges," "Manufacture of linen," "New Zealand," "Bacteria," "Antwerp Exhibition," "Gossip about ghosts," and others.——J. Theobald and Co., 19, Farringdon Road, E.C.: Lanterns and slides from the toy style to the professional apparatus are to be found illustrated in the new catalogue of this firm. We observe that parts of lanterns are now supplied for those who intend building their own appliances. Over 100 pp. are devoted to names of sets of slides, some being coloured lithographic, and others photographs, either plain or coloured.——Curtis Bros., Suffolk Street, Dublin, send us a particularly neat and well-printed catalogue, which contains illustrations of both standard photographic and lantern apparatus, and also those of their own manufacture. Several useful formulæ are to be found at the end of the catalogue. We observe that although the price of the catalogue is 6d., this firm distinctly state that this will be refunded on receipt of the first 5s. order.——Messrs. Riley Bros., 55 and 57, Godwin Street, Bradford, have just issued a new and comprehensive catalogue of a somewhat different style to those usually issued by lantern dealers. It is replete with an enormous list of slides, whilst a good many pages are devoted to the illustration of single, bi-unial, triple lanterns, saturators, gauges, and the usual necessary adjuncts pertaining to use of same.

——:o:——

Correspondence.

SHOULD CATALOGUES BE CHARGED FOR?

To the Editor.

Sir,—I was gratified to see this question raised in last journal. Personally I have done my fair share of buying, and have at different times spent large sums of money on slides and apparatus. When I at any time hear of something new being brought out, I, anxious to keep up to date, wish to possess it should it be within my means. Now before I make the purchase I always want to know as much as I can about it, so I of course ask the person who has it for sale to send me particulars. Other people I presume do the same, and as the dealer would entail a good deal of work upon himself in giving descriptions, what does he do? Why, he prints particulars, and those particulars he includes with those of different apparatus, and this is termed a catalogue. If I have to pay for this catalogue I am practically paying the dealer for replying to my request to supply particulars of so and so. In nine cases out of ten it is more to the dealer's interest to sell than mine to buy; he then should, on request, supply particulars free.

Yours truly,
ONE WHO SPENDS TWENTY POUNDS A SEASON.

To the Editor.

Sir,—Dealers are nearly always willing to spend considerable time in supplying any reasonable information to intending purchasers if they will be at the trouble to call personally upon them, but when the parties will not take the trouble to call, then they must expect to pay for the trouble that is taken to get up a catalogue to send on to them. Once an enquirer calls personally, a clever shopman will endeavour to sell something or other and present a catalogue into the bargain; but when it comes to sending through the post, perhaps to gratify someone's curiosity, then I consider it quite right that the applicant should at least contribute something towards the expense of the catalogue.—Yours, &c.,

R. MILLS.

To the Editor.

Sir,—The above question is a very wide one, and only touches one of the many points on which the public has reason to complain as to the ways of "the trade." If we look a long way back into history, we shall find that the manufacturer retailed the wares he made direct to the user. Then, with the gradual introduction of machinery, the manufacturer's power of production greatly increased, and altogether exceeded his power of distribution. Hence the catalogue and the dealer. Nowadays anyone with the means to get letter-heads printed can become a dealer in optical and photographic goods, and such small fry protect themselves against possible loss by charging for catalogues. That is practically one side of the case, and on the other much may be said against the selfishness of the customer who will coolly ask for a large catalogue of say 500 pages, gratis and post free, when he knows perfectly well he only intends to purchase perhaps a twenty-five shilling tin lantern, or a box of limes, or something equally trifling. If a customer would indicate what it is he contemplates purchasing, I am sure no one would mind forwarding free the part of catalogue referring to such goods; an excellent plan which is adopted by some of the larger houses. In the case referred to, your correspondent "Argumentum ad crumenam" need not be alarmed, as nearly every dealer of note will possess a copy of the catalogue of which he complains, and allow the same to be inspected on application. Some of the foregoing remarks may lead to the belief that this letter emanates from an interested party, so allow me to subscribe myself,

Yours faithfully,
UNCONNECTED WITH THE TRADE.

To the Editor.

Sir,—Our attention has been drawn to the letter in your Journal for September 1st, at the correspondent asking should catalogues be charged for? We think if he was a manufacturer he would not have any difficulty whatever in answering this question. As a matter of fact there are hundreds of people who every season make it a rule to send round to every house of any note in the trade, asking for detail catalogue simply with the intention of comparing prices one against another, or out of curiosity to see what novelties there are in lanterns, slides, and apparatus. Now a house of any note spends from £200 to £500 a year in getting a catalogue of some 150 to 300 pages. To give these away to any person who likes to apply for them would mean a very large order. As a matter of fact, we believe that most houses supply the catalogue at half the cost of production, and besides pay the cost of postage from 3d. to 4½d., according to the weight of the line. We do not think any house would have any objection to give a catalogue gratis, providing they were sure of an order resulting. But you can imagine at a low average 300 people in the country sending round to a dozen different large houses and getting an elaborate catalogue from each, for which they pay nothing whatever, and out of which they will give one small order of a few shillings to one firm out of the entire lot. If a catalogue consisted of a dozen pages it would be quite right to expect it free, but we do not think any reasonable person, looking at the matter in a right light, would expect to get an expensive catalogue given to them free of all charge. We are quite sure that other manufacturers will agree with us, that while the catalogue does materially assist in increasing business, yet it would not do to make a rule to give these away gratis. It might be a good thing perhaps to make a rule that where a catalogue is charged for, the cost of the catalogue shall be allowed out of the first order sent. We do not think that the majority of makers would care to go further than this.

Yours truly,

J. THEOBALD & CO.

To the Editor.

SIR,—Many people have a weakness for collecting catalogues of different firms, and comparing all details, and after they have in this manner spent a great deal of time their purchase will amount to perhaps a few pence. Should a man write to a dealer for particulars of any particular apparatus he is entitled to receive an answer, but when he expects the dealer to supply him with a sketch of apparatus as well as the other particulars, it cannot be considered exorbitant that he contribute a trifle towards producing the illustration. Dealers should have catalogues printed in two styles, one with a short description and prices, and another with illustrations. On application the former should be sent free of charge with a printed slip to say that on receipt of a certain amount, illustrations of the various objects would be sent. This plan would be quite fair to both the dealer and the intending purchaser.

Yours sincerely,

R.S.P.

——:o:——

Notes and Queries.

H. M. Underhill writes:—"Can you tell me whether there is any set of slides in existence illustrating the history and development of the bicycle, if so where can I hire them?" *Reply.*—We have not heard that such a set is commercial. Perhaps some of our readers may know; if so, will they kindly notify us. We understand that Badmington's book on cycling, which can be easily obtained, has a number of illustrations devoted to the subject.

Portable asks:—"Is a twelve feet screen generally considered small? *Ans.*—It all depends upon the dimensions of the room or hall in which the pictures are projected. In a small hall it would be considered large, whilst at such a place as the Crystal Palace theatre it would appear small. The question as to whether the size mentioned is small or large must be governed by the size of the place at which the pictures are to be shown, also taking into consideration the distance of the audience from the screen.

Knowledge is Power says:—"Can you inform me through Notes and Queries the formulæ for producing a purple tone on wet plate slides?" *Reply.*—This can be done by means of a weak solution of sulphide of potassium. You will find full particulars in an article on making and toning transparencies, which appeared in our issues for July and August, 1890, both of which numbers may be obtained for one penny each at our office.

J. Culey.—Kindly send particulars to us, and we will then probably bring the matter to the notice of Mr. Lovell, and our readers in general through our columns.

B. Boothroyd.—If the pressure of oxygen is decreased in order to keep the best possible light when the ether is running out, the time will come when the pressure will be so little that a pop will occur. The correspondent spoken of asked the result, if a modern saturator were allowed to exhaust the ether without reducing the pressure of the oxygen used previously, and we said, and still say, that the light would simply go out.

W. R. asks the best way to renovate an old lantern, the Japan of which is now shabby.—*Ans.*—Give it a coating of a mixture of lampblack and lacquer, or ordinary photographic varnish, and when dry give a coat of mastic or copal varnish, which imparts both solidity and gloss. This dries hard and tough. Brunswick black may be used for the purpose, but it gives off an offensive smell for a long time.

Rev. Evan Maclean.—The Chandor incandescer to which we alluded in the August Journal, is being introduced by the New Incandescent Light Company, Bucklersbury, Cheapside, E.C. The incandescer is placed in the flame.

W. Miles Barnes.—Thanks for your letter, but before publishing it we would prefer to obtain one of the limes as now made, for those we tried some time ago did not answer the description you give. Perhaps they have been improved since we tried them.

Wm. Nash.—Your question respecting saturators came too late in the month to enable us to deal with it, but perhaps we shall devote a short article to the subject in next issue, and give a simple diagram explaining the general use of a saturator, irrespective of any particular make.

Comic.—The fault you speak of is a common one when putting letters on comic slipping slides, and can be remedied at the time of making either by lettering backwards, or making the slip work from the other side. It can thus be made to operate from the proper side of the lantern.

E. R. Knight.—Your proposal shall have attention.

Gas.—You are simply misinformed.

If Matthew Honour, who sometime ago was operating for Col. Dyke, will communicate with us, he will hear of something to his advantage.

Messrs. R. W. Hill & Son, of Tufnell Park, N., lately received a letter from a Mr. Ovey, who omitted his address. Perhaps he will supply the omission.

——:o:——

MESSRS. LEA & SON, of Runcorn, the large manufacturers of gas cylinders, when writing to double the size of their advertisement, state:—

"WE ARE WELL SATISFIED WITH THE RESULTS FROM OUR SMALL ADVERTISEMENT IN THE 'OPTICAL MAGIC LANTERN JOURNAL.' AND WISH YOU EVERY SUCCESS."